CLAIMS:

We claim:

1. An apparatus for remotely detecting a gas molecule comprising:

a diode laser for emitting radiation at a maximum absorption band of said gas molecule wherein said radiation is tunable by adjusting the temperature of said diode laser; and

a single mode fiber coupling to said diode laser for diminishing of spatial inhomogenity of said radiation.

2. The apparatus as recited in Claim 1 wherein said gas molecule detector detects alcohol molecules.

3. The apparatus as recited in Claim 2 wherein said diode laser emits radiation near 1.392 um.

4. The apparatus as recited in Claim 1 wherein said gas molecule detector further comprises:

a first connection for a first current into the diode laser; and

a second connection for a second current adjusting the temperature of the diode laser.

5. The apparatus as recited in Claim 4 wherein said first current is a pulse with 3.6 ms period.

6. The apparatus as recited in Claim 4 wherein said second current is tunable for a maximum absorption band of said gas molecule.

7. The apparatus as recited in Claim 6 wherein said gas molecule is alcohol with an absorption band with Q-branch from 1.3924 – 1.3935 um.

8. The apparatus as recited in Claim 1 wherein said gas molecule detector further comprises:

an optical splitter receiving the emitted radiation and producing a first and second optical channels;

a first detector detecting the presence of said gas molecule from the first optical channel; and

a second detector for reference from the second optical channel.

9. The apparatus as recited in Claim 8 wherein said first detector detects the presence of alcohol molecules.

10. The apparatus as recited in Claim 8 wherein said second detector provides absorption reference of the content in a cell.

11. The apparatus as recited in Claim 10 wherein said cell contains a predetermine gas content.

12. The apparatus as recited in Claim 10 wherein said cell contains a predetermine water content.

13. The apparatus as recited in Claim 8 wherein said first optical channel capable of passing twice through an enclosure to be detected of said gas molecule, whereby the absorption of the gas molecule is amplified.

14. The apparatus as recited in Claim 8 wherein said second optical channel capable of passing twice through a cell having a predetermined second gas molecule content, whereby the absorption of said second gas molecule is amplified.

15. A computer system for controlling a remote gas molecule detector, said computer system comprising:

a microprocessor for running software wherein the software analyzes the data from photodetectors and controls said remote gas molecule detector;

a gas molecule detector controller for transforming data between the gas molecule detector and the computer system; and

a storage device for storing predetermined diode laser pulsed current and analyzed data.

16. A computer system as recited in Claim 15 wherein said gas molecule is alcohol.

17. A computer system as recited in Claim 15 wherein said remote gas molecule detector further comprises:

an analog to digital converter for sampling inputs into digitized data for storage in said computer system wherein said digitized data will be analyzed according to an absorption band of said gas molecules; and

a digital to analog converter for converting stored data into continuous data, wherein the continuous data couples to an input of said remote gas molecule detector.

18. A gas molecule detector system with a remote gas molecule detector, said system comprising:

a gas molecule detector wherein said gas molecule to be detected is remote from the computer system;

a computer system for running a software wherein the software analyzes the data from photodetectors and controls said remote gas molecule detector; and

an interface connecting said computer system and said gas molecule detector.

19. A gas molecule detector system as recited in Claim 18, wherein said interface comprises:

a diode laser supply transforming continuous diode laser current for remote gas molecule detector;

a resistance-voltage transformer providing good thermal contact with diode laser;

a peltier current supply providing power amplifier for pump current; and

photodetector transformer/amplifier unit for interfacing between a photodetector and a gas molecule controller.

20. The computer program product in a computer readable medium for a remote gas molecule detector comprising:

instructions for signal processing for generating diode laser current pulses;

instructions for stabilizing diode laser temperature wherein diode laser radiation is tunable by adjusting the temperature of said diode laser; and

instructions for calculating gas molecules concentration detected by said remote gas molecule detector.

21. The computer program product recited in Claim 20, wherein said instructions for signal processing further comprises:

first instructions for setting pattern of current pulses;

second instructions for storing pattern in a buffer memory; and

third instructions for applying pattern to a digital to analog converter.

22. The computer program product recited in Claim 21, wherein said current pulses is a high frequency square modulated with high amplitude.

23. The computer program product recited in Claim 20, wherein said instructions for temperature stabilization further comprises:

first instructions for setting initial diode laser temperature by thermistor; and

second instructions for switching to line stabilization position.

24. The computer program product recited in Claim 23, wherein said instructions for setting initial diode laser temperature by thermistor further comprises:

instructions for receiving resistance/voltage signal from said thermistor;

instructions for calculating actual said thermistor temperature;

instructions for calculating temperature difference between said actual temperature and set predetermine laser temperature; and

instructions for determining the pump current.

25. The computer program product recited in Claim 23, wherein said instructions for switching to line stabilization position further comprises:

instructions for receiving sampled analytical photodetector signal;

instructions for separating each pulse according to a period;

instructions for subtracting zero signal from said sampled analytical photodetector signal wherein zero signal is an photodetector signal when said diode laser is switched off and wherein said instruction for subtracting zero signal lessens interference;

instructions for further dividing said separate pulse into an odd and even array;

instructions for calculating the logarithm of the ratio of respective even points in said even array over odd points in said odd array wherein low-frequency signal interference is removed;

instructions for mutual orthogonalizing the correlated factors of alcohol;

instructions for mutual orthogonalizing the correlated factors of water;

instructions for calculating correlation factor with alcohol function with orthogonalization of water; and

instructions for calculating correlation factor with water function with orthogonalization of alcohol.

26. The computer program product recited in Claim 20, wherein said instructions for calculating gas molecule concentration further comprises:

first instructions for receiving sampled data from said remote gas molecule detector;

second instructions for checking and comparing said sampled data with predetermined fourier transform featuring absorption of said gas molecule and absorption a predetermined molecule content in a reference cell;

third instructions for producing distinctive channels;

fourth instructions for separating the channel containing the detected gas molecule according to discrete pulses of a diode laser current;

fifth instructions for generating an odd and even arrays from said gas molecule channel;

sixth instructions for subtracting zero signal from odd array;

seventh instructions for subtracting zero signal from even array;

eighth instructions for calculating the logarithm of even over odd ratio; and

ninth instruction for mutual orthogonalization of said gas molecule to be detected and content in the reference cell thereby, the concentration of gas molecule is calculated.

27. An apparatus for remotely detecting alcohol comprising:

a diode laser for emitting scanning radiation frequency at a maximum alcohol absorption band;

a first connector for a first current into the diode laser; and

a second connector for a second current adjusting the temperature of the diode laser.

28. An apparatus for remotely detecting alcohol comprising:

a diode laser for emitting radiation at a maximum alcohol absorption band wherein the radiation is tunable by adjusting the temperature of the diode laser;

an optical splitter receiving the emitted radiation and producing a first and second optical channels;

a first detector detecting the presence of a alcohol vapor from the first optical channel; and

a second detector for reference from the second optical channel.

29. An apparatus for remotely detecting alcohol comprising:

a diode laser for emitting radiation at a maximum alcohol absorption band wherein the radiation is tunable by adjusting the temperature of the diode laser;

an optical channel that pass through an enclosure to be detected of alcohol vapor twice, whereby the absorption of the alcohol vapor is amplified; and

a detector detecting the presence of a alcohol vapor from the optical channel.

30. An apparatus for remotely detecting a gas molecule comprising:

a diode laser for emitting radiation at a maximum absorption band if said gas molecule;

a single mode fiber coupling to the diode laser for diminishing of spatial inhomogenity of the radiation;

a first connection for a first current into the diode laser;

a second connection for a second current adjusting the temperature of the diode laser;

an optical splitter receiving the emitted radiation and producing a first and second optical channels;

a first detector detecting the presence of said gas molecule from the first optical channel; and

a second detector for reference from the second optical channel.